ABSTRACT OF THE DISCLOSURE

The present invention is based on the practice of abrasive machining with no sealed working chamber by the employment of a visco-elastic abrasive medium, behaving predominantly as an elastic solid at the applied strain of the orbital working motion, and applying orbital or other relative working motion to produce strain rates which bring the medium into a predominantly elastic deformation and often near, but not to exceed, the compressive stress limit at the strain rate employed. The preferred visco-elastic abrasive medium is a rheopectic poly(boro-siloxane) filled with viscosity increasing stiffening agents and high loadings of the abrasive of choice and relatively mono amounts of plasticizers. The system is operated in an open chamber under applied strain rates such that at least 50 %, particularly about 50 to 99 %, and preferably about 80 to 95 %, of the deflection of the medium under the conditions of operation occurs by elastic deformation and is elastically recovered, and less than 50 % particularly about 1 to 50 %, preferably about 5 to 20 %, of the deflection of the medium occurs by fluid or plastic flow.